

## CLAIMS

We claim:

- 1 1. An intrusion detection method, comprising the steps of:
  - 2 storing a plurality of signatures in a signature table of an intrusion detection system; and
  - ranking at least two signatures of the plurality of signatures by likelihood of occurrence.
- 2 2. The method of claim 1, wherein the plurality of signatures includes at least one null signature.
- 1 3. The method of claim 1, wherein said at least two signatures includes at least one null
- 2 signature.

- 1 4. An intrusion detection method, comprising the steps of:
- 2 storing a plurality of signatures in a signature table of an intrusion detection system;
- 3 detecting, by the intrusion detection system, a system event; and
- 4 comparing the system event with the plurality of signatures;
- 5 wherein the step of comparing is performed in a sequence according to a ranking of the
- 6 plurality of signatures by likelihood of occurrence.
- 1 5. The method of claim 4, wherein the ranking of the plurality of signatures by likelihood of
- 2 occurrence is computed from occurrence data.

1 6. An intrusion detection method, comprising the steps of:

2 storing a plurality of signatures in a signature table of an intrusion detection system, said  
3 plurality of signatures including at least one null signature;

4 ranking the plurality of signatures by likelihood of occurrence to provide a ranking order;

5 detecting, by an intrusion detection system, a system event; and

6 comparing the system event with the plurality of signatures;

7 wherein the step of comparing is performed in a sequence according to the ranking order.

1 7. A method of managing a signature table for an intrusion detection system, comprising the  
2 steps of:

3 detecting, by an intrusion detection system, a system event;

4 determining whether a signature table of the intrusion detection system includes a  
5 signature with a signature event that matches the system event; and

6 when the signature table does not include a signature with a signature event that matches  
7 the system event, storing, in the signature table, a null signature with a signature event that  
8 matches the system event.

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8. A method of managing a signature table for an intrusion detection system, comprising the  
steps of:

detecting, by an intrusion detection system, a system event;

determining whether a signature table of the intrusion detection system includes a  
signature event that matches the system event; and

when the signature table includes a signature event that matches the system event,  
updating occurrence data associated with the signature event.

1 9. The method of claim 8, further including the step of ranking at least two signatures included  
2 in the signature table by likelihood of occurrence computed from the occurrence data.

1 10. The method of claim 8, further including the step of:

2 when the signature table does not include a signature event that matches the system event,  
3 storing a null signature in the signature table.

4 11. The method of claim 10, wherein the null signature includes a signature event that matches  
5 the system event.

1 12. An intrusion detection method, comprising the steps of:

2 detecting, by an intrusion detection system, a system event;

3 determining whether a cache of the intrusion detection system includes a signature event  
4 that matches the system event;

5 when the cache does not include the signature event, determining whether a signature  
6 table of the intrusion detection system includes the signature event; and

7 when the signature table does not include the signature event, storing the signature event  
8 in the cache.

1 13. The method of claim 12, wherein the signature event is stored in the cache as part of a null  
2 signature, and wherein the step of storing includes a step of storing the null signature in the  
3 cache.

1 14. An intrusion detection system, comprising:

2 an event detector for detecting a system event;

3 a signature table comprising signatures; and

4 logic for searching the signature table responsive to detection of the system event by the  
5 event detector;

6 wherein the signature table includes at least one null signature and at least one signature  
7 that is not a null signature.

1 15. A signature table of an intrusion detection system, said signature table comprising a plurality  
2 of signatures, wherein at least one signature of the plurality of signatures includes occurrence  
3 data.

1 16. A signature table of an intrusion detection system, said signature table comprising a plurality  
2 of signatures, wherein at least one signature of the plurality of signatures is a null signature.

1 17. The signature table of claim 16, wherein at least one signature of the plurality of signatures  
2 includes occurrence data.

1 18. The signature table of claim 16, wherein at least one signature of the plurality of signatures is  
2 a null signature that includes occurrence data.

1 19. An intrusion detection system, comprising:

an event detector for detecting a system event;

a signature table comprising signatures; and

logic for searching the signature table responsive to detection of the system event by the  
5 event detector;

6 wherein the logic searches the signature table in a sequence according to a ranking of the  
7 signatures by likelihood of occurrence.

1 20. The intrusion detection system of claim 19, wherein likelihood of occurrence is observed  
2 frequency of occurrence computed from occurrence data.